



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,768	12/12/2001	Paul A. Geel	25151A	8672

22889 7590 02/24/2005

OWENS CORNING
2790 COLUMBUS ROAD
GRANVILLE, OH 43023

EXAMINER

BOYD, JENNIFER A

ART UNIT	PAPER NUMBER
----------	--------------

1771

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,768

Applicant(s)

GEEL, PAUL A.

Examiner

Jennifer A Boyd

Art Unit

1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 11-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The Applicant's Amendments and Accompanying Remarks, filed December 1, 2004, have been entered and have been carefully considered. Claims 1, 4, 22 and 24 are amended and claims 1 – 8 and 11 – 24 are pending. In view of Applicant's amendments incorporating the claim language of claim 4 into claim 1 and amending claims 22 and 24 to require that the web contains about 10 to less than 50 percent by weight of glass fibers, the Examiner has revised the previously applied rejections below. The invention as currently claimed is not found to be patentable for reasons herein below.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1 – 8, 11, 13 – 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heidweiller (US 3,622,445).

Heidweiller is directed to composite glass fiber webs.

As to independent claim 1, Heidweiller teaches a web comprising glass fibers and polyester fibers (Abstract). In Example II, the polyester fibers are polyethylene glycol terephthalate fibers (also known as polyethylene terephthalate fibers) which have a linear density of 1.5 denier (column 4, lines 1 – 5). Using the formula $\text{diameter } (\mu\text{m}) = \sqrt{(\text{denier} / (.00707 \times \text{density (cc)}))}$ and assuming a density of 1.38 cc for polyethylene terephthalate, the diameter of

Art Unit: 1771

the fibers would be 12.4 μm . It is the position of the Examiner that 12.4 μm would meet Applicant's requirement of being "*about* 12 microns". The weight ratio between the glass fibers and the organic fibers, such as the polyethylene terephthalate fibers, ranges from 10:1 to 1:1 (Abstract). Thus, the glass fibers are present in a proportion of 50 - 100% and the polyethylene terephthalate fibers are present in a proportion of 10 - 50%. It should be noted that the amount of polyethylene terephthalate fibers disclosed by Heidweiller overlap with Applicant's claimed invention. The web also comprises a binder (Abstract). The binder can be selected from a great variety of materials including polyvinyl alcohol (column 2, lines 50 - 70). The polyvinyl alcohol binder of Heidweiller is equated to the Applicant's "polyvinyl alcohol" and "secondary binder". The proportion of the binder is preferably 5 - 50 percent, calculated on the total weight of the web (Abstract).

As to claim 2, Heidweiller teaches that the glass fibers can be C-glass fibers or preferably E-glass fibers (column 1, lines 57 - 70).

As to claim 3, Heidweiller teaches that the E-glass fibers have a diameter of 4 - 15 microns (column 1, lines 60 - 65). In Example 1, the E-glass fibers have a length of 10mm (column 3, lines 20 - 25).

As to claim 4, Heidweiller teaches that the polyethylene terephthalate fibers have a length of 6 mm (column 4, lines 1 - 5).

As to claim 8, Heidweiller teaches that the binder can be in the form of fibers or water-dispersible granules (column 3, lines 1 - 5).

As to claim 11, Heidweiller teaches that the binder can be in the form of water dispersible granules, therefore, it could be a water-based emulsion or a solution-type binder.

Art Unit: 1771

As to claim 21, Heidweiller teaches a polyvinyl alcohol binder. As mentioned in the above paragraphs, the Examiner has equated to the binder to the “secondary binder” along with the polyvinyl alcohol.

As to claims 5 and 7, although Heidweiller does not explicitly teach the claimed properties that the polyethylene terephthalate fibers have a melting point above about 250 degrees Celsius as required by claim 5 and polyethylene terephthalate fibers do not melt below 220 degrees Celsius as required by claim 7, it is reasonable to presume that the polyethylene terephthalate fibers have a melting point above about 250 degrees Celsius as required by claim 5 and polyethylene terephthalate fibers do not melt below 220 degrees Celsius as required by claim 7 is inherent to Heidweiller. Support for said presumption is found in the use of like materials (i.e. polyethylene terephthalate fibers having a diameter from about 6 to 16 microns) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties would obviously have been present once the Heidweiller product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

As to claims 1 and 13 - 18, Heidweiller discloses the claimed invention except for that the glass fibers are present in the weight of about 10 to less than 50% and the polyethylene terephthalate fibers have a diameter of from about 6 to 12 microns as required by claim 1, the glass fibers are present in the amount of 25 to 40 % by weight of the fibers as required by claim 13, the polyethylene terephthalate fibers are present in the amount of 60 – 75% by weight of the fiber as required by claim 14, the polyvinyl alcohol is present in the amount of 16 to about 20% by the total weight of the glass fibers and the polyethylene terephthalate fibers as required by

Art Unit: 1771

claim 15, the secondary binder is provided in an amount of about 15 to 25% of the total weight of the base web as required by claim 16, the base web comprises glass fibers in the amount of 25 to about 40 percent by weight, polyethylene terephthalate fibers in the amount of 60 to about 75 % by weight and the polyvinyl alcohol in an amount of about 16 to about 20% by total weight of the glass fibers and the polyethylene terephthalate fibers as required by claim 17, the secondary binder is present in the amount of about 15 to about 25 of the total weight of the base web as required by claim 18. It should be noted that the combined total of polyvinyl alcohol and secondary binder in the web, the amount of PET fibers, the amount of glass fibers and the diameter of the PET fiber are result effective variables. As the amount of the binder increases, the mat increases in strength and dimensional stability. As the amount of glass fibers increase, the compressive strength increases. As the amount of polyethylene terephthalate fibers increase, the tear strength increases. As the polyethylene terephthalate fiber diameter increases, the fiber becomes stronger and as the diameter decreases, the fiber becomes more pliable and softer to the touch. It would have been obvious to one having ordinary skill in the art at the time the invention was made to create a web with the glass fibers are present in the weight of about 10 to less than 50 % and the polyethylene terephthalate fibers have a diameter of from about 6 to 12 microns as required by claim 1, the glass fibers are present in the amount of 25 to 40 % by weight of the fibers as required by claim 13, the polyethylene terephthalate fibers are present in the amount of 60 – 75% by weight of the fiber as required by claim 14, the polyvinyl alcohol is present in the amount of 16 to about 20% by the total weight of the glass fibers and the polyethylene terephthalate fibers as required by claim 15, the secondary binder is provided in an amount of about 15 to 25% of the total weight of the base web as required by claim 16, the base

Art Unit: 1771

web comprises glass fibers in the amount of 25 to about 40 percent by weight, polyethylene terephthalate fibers in the amount of 60 to about 75 % by weight and the polyvinyl alcohol in an amount of about 16 to about 20% by total weight of the glass fibers and the polyethylene terephthalate fibers as required by claim 17, the secondary binder is present in the amount of about 15 to about 25 of the total weight of the base web as required by claim 18, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the amount of polyvinyl alcohol, secondary binder, glass fibers and polyethylene terephthalate fibers to create a pliable, strong, highly dimensionally stable web with high tear and compressive strength.

4. Claims 19, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heidweiller (US 3,622,445) in view of Helwig et al. (US 6,267,843).

As to independent claim 22, Heidweiller teaches a web comprising glass fibers and polyester fibers (Abstract). In Example II, the polyester fibers are polyethylene glycol terephthalate fibers (also known as polyethylene terephthalate fibers) (column 4, lines 1 – 5). The weight ratio between the glass fibers and the organic fibers, such as the polyethylene terephthalate fibers, ranges from 10:1 to 1:1 (Abstract). Thus, the glass fibers are present in a proportion of 50 - 100% and the polyethylene terephthalate fibers are present in a proportion of 10 – 50%. It should be noted that the amount of polyethylene terephthalate fibers disclosed by Heidweiller overlap with Applicant's claimed invention. The web also comprises a binder (Abstract). The binder can be selected from a great variety of materials including polyvinyl

Art Unit: 1771

alcohol (column 2, lines 50 – 70). The polyvinyl alcohol binder of Heidweiller is equated to the Applicant's "polyvinyl alcohol" and "secondary binder".

Heidweiller fails to disclose that the polyvinyl alcohol binder in fiber form has a diameter of from about 6 to 16 microns and a length from 4 to about 25 mm.

Helwig et al. teaches a wet-laid nonwoven mat comprising glass fibers, polymeric binder fibers and/or powder and optionally polyvinyl alcohol (column 1, lines 55 – 63). The polyvinyl alcohol binder fiber can be type VPB101 from Kuraray Co (column 5, lines 5 – 15). According to Yamamoto et al. (US 4,483,976), Kuraray VPB101 has a denier of 1.3 and length of 4mm (column 5, lines 58 – 63). Assuming a density of 1.26 g/cm^3 as stated in *Polymers – A Property Database*, the fiber diameter is 12 microns.

It would have been obvious and necessary for one of ordinary skill in the art practicing the invention of Heidweiller to provide the details of the polyvinyl alcohol binder in fiber form. As the size and length of the binder fibers determine the strength of the bound web fibers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use binder fibers with a length of 4 mm and a fiber diameter of 12 microns as suggested by Helwig in the invention of Heidweiller motivated by the expectation of successfully practicing the invention of Heidweiller.

Heidweiller in view of Helwig discloses the claimed invention except for that the polyvinyl alcohol fiber has a diameter of between about 6 and 11 microns as required by claim 23 and the base web has about 10 to less than 50% by weight of glass fibers as required by claim 22. It should be noted that the diameter of the polyvinyl alcohol fiber and the weight percentage

Art Unit: 1771

of glass fibers are result effective variables. As the diameter increases, the fiber becomes stronger and as the diameter decreases, the fiber becomes more pliable. As the amount of glass fibers increase, the compressive strength increases. It would have been obvious to one having ordinary skill in the art at the time the invention was made to create a polyvinyl alcohol fiber with a diameter of between about 6 and 11 microns as required by claim 23 and the base web has about 10 to less than 50% by weight of glass fibers as required by claim 22, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to create a mat having a polyvinyl alcohol fiber with a diameter between 6 and 11 microns and 10 to less than 50% by weight of glass fibers in order to create a strong and pliable fiber mat with suitable compressive strength.

5. Claims 20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heidweiller (US 3,622,445) in view of Kinsley, Jr. (US 5,800,675).

As to independent claim 24, Heidweiller teaches a web comprising glass fibers and polyester fibers (Abstract). In Example II, the polyester fibers are polyethylene glycol terephthalate fibers (also known as polyethylene terephthalate fibers) (column 4, lines 1 – 5). The weight ratio between the glass fibers and the organic fibers, such as the polyethylene terephthalate fibers, ranges from 10:1 to 1:1 (Abstract). Thus, the glass fibers are present in a proportion of 50 - 100% and the polyethylene terephthalate fibers are present in a proportion of 10 – 50%. It should be noted that the amount of polyethylene terephthalate fibers disclosed by Heidweiller overlap with Applicant's claimed invention. The web also comprises a binder

Art Unit: 1771

(Abstract). The binder can be selected from a great variety of materials including polyvinyl alcohol (column 2, lines 50 – 70). The polyvinyl alcohol binder of Heidweiller is equated to the Applicant's "polyvinyl alcohol" and "secondary binder". The proportion of the binder is preferably 5 – 50 percent, calculated on the total weight of the web (Abstract).

Heidweiller fails to disclose that the polyvinyl alcohol binder in powder form has a particle size from about 50 to 250 microns.

Kinsley, Jr. teaches a paper-based product comprising a particulate binder (Abstract). The preferred binder is a polyvinyl alcohol powder (Abstract). The binder has a dry size diameter of 88 – 220 microns and a swollen size diameter of 176 – 440 microns.

It would have been obvious and necessary for one of ordinary skill in the art practicing the invention of Heidweiller to provide the details of the polyvinyl alcohol binder in powder form. As the size of the binder particles determine the strength of the bound web fibers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a binder with a dry size diameter of 88 – 220 microns as suggested by Kinsley, Jr. in the invention of Heidweiller motivated by the expectation of successfully practicing the invention of Heidweiller.

Heidweiller in view of Kinsley, Jr. discloses the claimed invention except for that the base web has about 10 to less than 50% by weight of glass fibers. It should be noted that the weight percentage of glass fibers are result effective variables. As the amount of glass fibers increase, the compressive strength increases. It would have been obvious to one having ordinary skill in the art at the time the invention was made to create the base web having about 10 to less

Art Unit: 1771

than 50% by weight of glass fibers, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to create a mat having a base web comprising from 10 to less than 50% by weight of glass fibers in order to create a mat with suitable compressive strength.

6. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Helwig et al. (US 5,935,879).

Helwig is directed to a non-woven fiber mat suitable for reinforcing resilient sheet floor coverings, such as vinyl floor coverings (Abstract).

As to claim 1, Helwig teaches a non-woven wet-laid mat (column 2, lines 35 – 40) comprising reinforcement fibers including glass fibers and synthetic fibers (column 2, lines 35 – 50). Helwig teaches that the synthetic fiber can comprise polyester (column 2, lines 45 – 50), or specifically, polyethylene terephthalate (Example 5, lines 60 – 68). Helwig teaches that the polyethylene terephthalate fibers used in Example 5 are 1.7 dtex (1.53 denier). It should be noted that the fibers would have a diameter of approximately 12.6 microns assuming a density of 1.35 g/cc. Helwig teaches that one or more binders may be used to binder the reinforcement fibers (column 2, lines 53 – 55). Helwig teaches that the binders can be in particle form such as polyvinyl alcohol powder and fiber form such as vinyl chloride copolymer or a combination of both (column 2, lines 59 – 65). Helwig teaches that the binder may include a preliminary binder to bind the reinforcement fibers together to enable the sheet to be subsequently processed into a fiber mat. The Examiner equates the polyvinyl alcohol powder to Applicant's "polyvinyl

Art Unit: 1771

alcohol". The polymeric binder may also include a secondary binder to bond the reinforcement fibers to provide the fiber mat with substantial resistance to planar elongation and yet still allow a substantial degree of planar compressive movement (column 3, lines 45 – 55).

As to claim 6, Helwig teaches that the synthetic fibers can be aramid fibers (column 5, lines 16 – 21).

Helwig discloses the claimed invention except for that the web has glass fibers in the amount of 10 to less than 50 percent by weight, the polyethylene terephthalate fibers have a diameter of from about 6 to 12 microns and are present in the amount of 50 – 90% by weight required by claim 1. It should be noted that the combined total of polyvinyl alcohol and secondary binder in the web, the amount of PET fibers, the amount of glass fibers and the diameter of the PET fiber are result effective variables. As the amount of glass fibers increase, the compressive strength increases. As the amount of polyethylene terephthalate fibers increase, the tear strength increases. As the polyethylene terephthalate fiber diameter increases, the fiber becomes stronger and as the diameter decreases, the fiber becomes more pliable and softer to the touch. It would have been obvious to one having ordinary skill in the art at the time the invention was made to create the web has glass fibers in the amount of 10 to less than 50 percent by weight, the polyethylene terephthalate fibers have a diameter of from about 6 to 12 microns and are present in the amount of 50 – 90% by weight required by claim 1, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the amount of PET fibers and glass fibers and the

Art Unit: 1771

diameter of the PET fibers to create a web with an appropriate level of pliability, tear strength and compressive strength.

7. Claim 12 remains rejected under 35 U.S.C. 103(a) as being unpatentable over Helwig et al. (US 5,935,879) in view of Helwig et al. (US 6,365,001). The details of the rejection can be found in paragraph 8 of the previous Office Action dated February 2, 2004. The rejection is maintained.

Response to Arguments

8. Applicant's arguments filed October 10, 2003 have been fully considered but they are not persuasive.

9. In response to Applicant's arguments that Heidweiller and Helwig do not teach that the claimed base web including about 10 to less than 50 percent by weight of glass fibers and polyethylene terephthalate fibers having a diameter between 6 to about 12 microns, the Examiner respectfully argues that it would have been obvious to optimize the ranges to create a nonwoven web with high flexibility, compressive and tensile strength. The Examiner acknowledges that Heidweiller and Helwig both teach the use of 50% or more of glass fibers. However, absent any evidence to the contrary, the Examiner submits that the disclosure of the use of 50% by weight of glass fibers could be optimized to an amount below 50% by weight as required by claim 1 or between 25 to about 40% as required by claim 13. If the presence of 10 to less than 50% by weight of glass fibers in the mat has unexpected results, the burden is upon the Applicant to demonstrate that the claimed ranges are not a matter of simple optimization. The Examiner

Art Unit: 1771

highly suggests to the Applicant to submit a 37 CFR 1.132 Declaration to establish unexpected results. In the Declaration, the Applicant should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. In re Hill, 284 F.2d 955, 128 USPQ 197 (CCPA 1960) and must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness.

10. In response to Applicant's Arguments regarding the rejection over Heidweiller in view of Kinsley, Jr., the Examiner respectfully argues the contrary. Heidweiller and Helwig are both directed to wet-laid glass fiber webs with a polyvinyl alcohol binder for use in high strength applications, therefore, they are considered to be in the same field of endeavor. Heidweiller teaches the claimed invention except fails to disclose *any* details of the polyvinyl alcohol binder. Therefore, it would have been obvious and *necessary* for one of ordinary skill in the art practicing the invention of Heidweiller to provide the details of the polyvinyl alcohol binder.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1771

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Boyd whose telephone number is 571-272-1473. The examiner can normally be reached on Monday thru Friday (8:30am - 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jennifer Boyd
February 8, 2005



TERREL MORRIS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700